February, 1954

THE CHEMIST

VOLUME XXXI NUMBER 2

Dr. WALTER G. WHITMAN

Receives Honorary AIC Membership

(See page 49)

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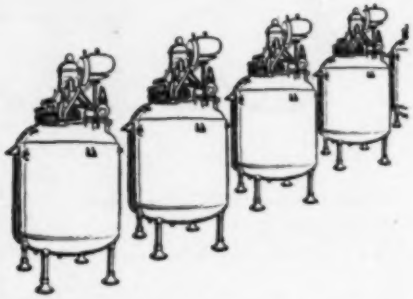

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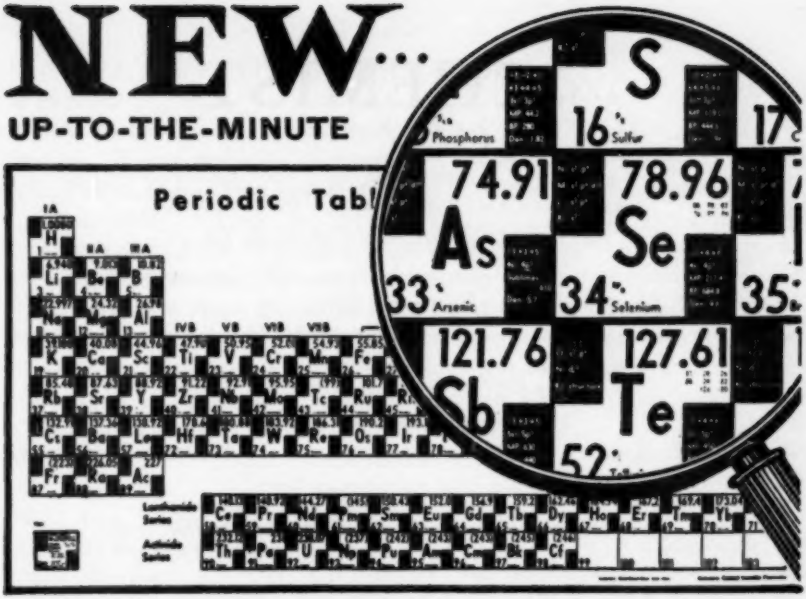

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Rewards for Chemists—Financial and Other, Morris T. Carpenter.

IN THIS ISSUE

Editorial:
The Literature of Chemistry, Fred P. Peters, F.A.I.C. **45**
Report (Letter to National Security Training Commission) **46**
The Professional Man and Defense, Dr. Walter G. Whitman, Hon. AIC **49**
Introduction of Dr. Whitman, Earl P. Stevenson, F.A.I.C. **51**
Presentation to Dr. Whitman **52**
How Chemists Have Developed the Field of Polyethylene, Roger Williams, Jr., M.A.I.C. **55**
Greetings Presented to the Chemical Society of Japan **61**
The Ohio AIC Describes "The Chemist" on TV **65**
Communications **68**
Council **70**
AIC Activities **71**
Will You Come **73**
To AIC Members Who Travel **74**
Opportunities **74**
For Your Library **76**
Something New **78**
Condensates **80**

TO COME

In the March CHEMIST, the Pennsylvania Chapter's Honor Scroll Award to Dr. Hugn W. Field, vice president and director of research of the Atlantic Refining Company, will be featured. Morris T. Carpenter, administrative director of Standard Oil Company (Indiana) will discuss frankly that important subject, "Rewards for Chemists—Financial and Other." The Chicago Chapter has supplied us with some of the questions and answers that came up in the discussion that followed Mr. Carpenter's talk. Other features and professional news will make this issue worth careful reading. We shall also have a preview of the program of the 1954 Annual Meeting in the March issue.

TO SERVE YOU

Robert S. Aries 75
Baker & Adamson ..... Inside Front Cover
J. T. Baker Chemical Co. 44
Central Scientific Co. 41
Croll-Reynolds Co., Inc. 80
Evans Research & Development Corp. 73
Fisher Scientific Co. ..... Inside Back Cover
Hardesty Chemical Division 63
Johns-Manville 47
O. Johnson & E. Scudder 59
Laboratory Furniture Co., Inc. 67
The Lento Press 78
E. Machlett & Sons 60
Mallinckrodt Chemical Works 64
Merck & Co., Inc. 54
Molnar Laboratories 66
Oldbury Electro-Chemical Co. 69
Perkin-Elmer Corp. 48
Phoenix Chemical Laboratory, Inc. 77
Refinery Supply Company 41
Robinette Research Labs., Inc. 68
Foster D. Snell, Inc. 79
U. S. Stoneware ..... Outside Back Cover

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EDITORIAL

The Literature of Chemistry

Fred P. Peters, F.A.I.C.

Vice President, Reinhold Publishing Corp., 330 West 42nd St., New York 16, N.Y.

SCIENTIFIC historians may some day take a dim view indeed of this essay. Not that these poor words could ever shake the foundations of chemistry, or loosen even a single stone. It is just that the literature of chemistry is, like the legendary camel, so overburdened that no one knows (least of all its author) which insignificant addition may be the one that will cause the whole structure to collapse. Pray, O Reader, that it will not be this little straw!

The output of chemical literature has multiplied frighteningly in the past twenty years alone. There are published, issued or mailed in one 1954 month, we are sure, more books, magazine articles, papers in journals, bulletins, abstracts, internal and external reports, and letters on chemistry and chemical engineering, than were distributed in the whole year of 1934. This is because chemistry as a whole has grown, because it has become increasingly specialized in its subdivisions, and because the number of chemists impelled to write or compelled to read about it has mounted steadily—and the end is not yet in sight.

Who will say that this has not been a healthy development, full of benefit to chemistry and to society as a whole? But also, who can deny that we may soon pass the point of diminishing return unless this vast output be somehow channeled or controlled. The waters of a dam must be channeled or controlled if an area is to have power and fertility rather than inundation.

The power and fertility of the chemical literature depend on (1) how it is writen; (2) how it is produced and distributed; (3) how it is classified; and (4) how it is read. In every one of these categories, great strides can be made; in some of them, spectacular achievement is already evident.

The growing movement toward better technical writing can reduce wasted words by the thousands and make each unit of our literature more useful. The many modern methods of producing and distributing chemical reports and bulletins that were exhibited and described at the sessions of the Chemical Literature Division of the A.C.S. last Fall testified to the amazing progress that has been made in that field alone. Again, just when it seemed that librarians and literature-researchers must surely lose their minds in the face of the hope-

lessly increasing mass of material to be sorted and classified, along came the punched cards and now the uncanny electronic data-processing machines to make something meaningful out of the mass, before it turns into a mess.

So all that remains is to teach us how to read faster, more retentively and therefore more efficiently. And even that is under successful study. Truly it is a chemist's—and a publisher's—dream come true!

Statement: By Secretary of Commerce Sinclair Weeks: The report of the Ad Hoc Nine-member Committee for Evaluation of the present functions and operations of the National Bureau of Standards, under the chairmanship of Dr. Mervin J. Kelly of Bell Telephone Laboratories and representing the National Academy of Sciences, is serving as a guide to the Department of Commerce and the Bureau in our joint efforts to strengthen the Bureau so that it can fully discharge its responsibilities to the nation.

The report of the Committee on Battery Additives of the National Academy of Sciences, under the chairmanship of Dr. Zay Jeffries, vice president (retired), General Electric Company, Chemical Division, is that the quality of the work of the Bureau in the field of lead acid storage battery testings "is excellent" and "is better now than at any time in the past." That scientific evaluation is an assurance to the public and a source of satisfaction to me and to the Bureau. I shall do all in my power to aid the Bureau in maintaining this high level of scientific service to the nation.

Report

President Work has sent the following letter to the Executive Director of the National Security Training Commission, Washington 25, D.C.

> "We have viewed with great concern the Army Reserve situation as it now exists by law and we have taken a position on the Flanders and its related House Bill to the effect that a non-partisan group, representing both military and civilian interests, should be formed to plan for the period when large groups of Reserves might have to be called into service.
>
> "We have stressed that a sacrifice of civilian interests in the protection of the Nation could seriously upset the program of military supply in the event of injudicious and wholesale calling of Reserves. We take no position as to the exact form in which the Nation's interest shall be protected against the special interests of the military forces but we feel strongly in America's best interest that some plan must be prepared in advance to insure at the very beginning of hostilities that American manpower shall be used where it best can serve.
>
> "We sincerely trust that in your consideration of selective recall of Reserves you will offer a firm and decisive answer which will secure the desired results."

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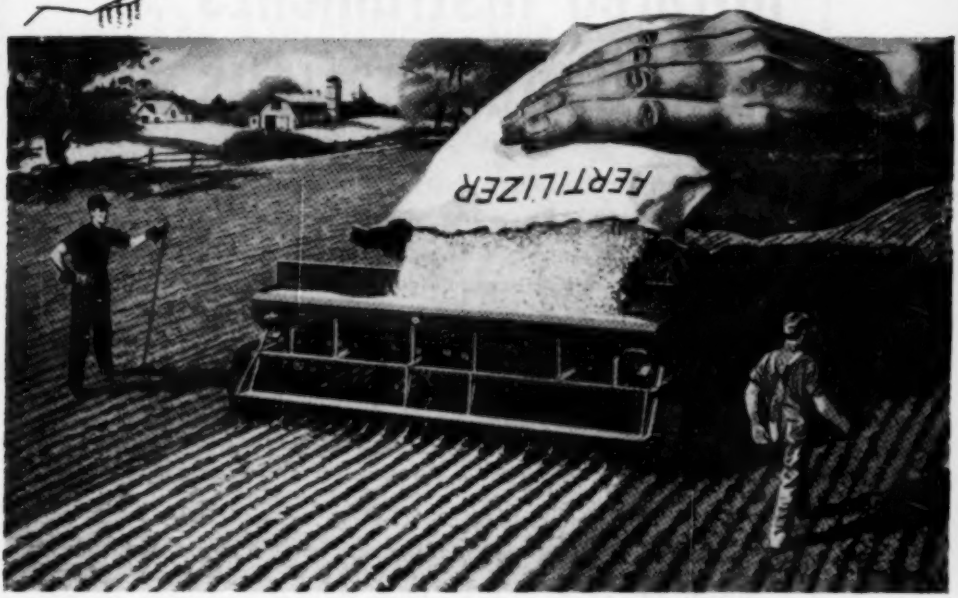

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The Professional Man and Defense

Dr. Walter G. Whitman, Hon.AIC

Head, Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, Mass.

(Acceptance address when the author received Honorary AIC Membership, at a meeting of the New England Chapter, November 18th.)

ON the subject of the professional man and defense, I have a serious conviction. President Eisenhower delivered a truly historic address before the Canadian Parliament recently. In speaking of defense he said, "Our security plans must now take into account Soviet ability to employ atomic attack on North America as well as on countries friendly to us, lying closer to the U.S.S.R. Their atomic stockpile will, of course, increase in size and means of delivery will increase as time goes on." Later on he said, "These days demand ceaseless vigilance. We must be ready and prepared. The threat is present."

Now these are long awaited words, particularly by those of us who have been involved in studying and trying to help cope with the problem for a long period. Only a clear statement by the President himself could cut through the welter of confusing and often contradictory opinions from Washington, and carry conviction to the citizens of North America. We must learn to live resolutely under this threat and we must take all practicable measures for meeting it.

Now as scientists and engineers we have unusually grave responsibilities in this era when the destructive potentialities of atomic weapons are steadily increasing. I propose to discuss three ways in which we individually can contribute. The first of these is public education, especially of our lay friends—both men and women. I regard it as a dis-service to conceal the brutal possibilities of our cities being bombed; a dis-service that will greatly intensify the panic fear of the unknown later on, when the concealment becomes impossible. Our citizens must be informed if they are to face the future with resolution and to support rational action by our political and our military leaders. Opportunities for personal service as educators in the technical aspects of the problems are available to all of us. Often the most effective medium will be informal and even casual meetings to which we can contribute responsible views and judgments.

The second opportunity for service is direct technical participation in the national program. Many of you are so serving on contracts with the military services, as consultants and advisors, and sometimes even as civilians or officers in the services. I am con-

vinced that greater civilian professional participation in the military program should be encouraged. Defense is becoming ever more technological. Only by the closest teamwork of the civilian scientist and the military professional can we achieve the strength which is essential to our security.

And the third suggestion is for understanding and a degree of tolerance for the complex process of creating a modern defense in our democracy. In the past we have never needed great military strength between our major wars because there was no necessity to be constantly alert against attack. Today, force indeed is imperative. We must have military leaders of the highest calibre and we must support them. My associations in government over the past two years have greatly strengthened my confidence in and my respect for our military men. They recognize the gravity of their tasks, they want to have technical help, and they are learning to accept it even when it upsets firmly established concepts. Theirs is a tremendous responsibility. Let us help to dispel the traditional civilian contempt for the military mind.

The top management of defense is a most difficult task. Unification within the Department of Defense started only seven years ago. The present Secretary of Defense, Mr. Wilson, is the fifth man to occupy the post in these seven years. Perhaps one can appreciate the problems of the Department of Defense by comparing it with a human being who must learn to walk and talk, must go through childhood and adolescence, before he acquires mature confidence. Today, while still adolescent, the department shows signs of early maturity. The Secretary of Defense and his associates function betwen the military, for which they are responsible, and the Congress. Defense intimately affects and is affected by other important factors of Government, notably the budget and foreign policy. This can be a most uncomfortable spot, especially when an organization that is still adolescent has much to learn and is subject to frequent shifts of top personnel. Considering the importance of defense and its demands on the youth and on the pocketbook of the nation, I think it is remarkable that the successive secretaries have done as well as they have in keeping the Defense Department out of the political arena. Public understanding and support are crucial in this task.

In conclusion, our responsibilities as professional men are now greatly accentuated. The threat of atomic attack is real. I have discussed three of the ways in which we might contribute. First, education of the layman in technical aspects. Second, direct participation in the defense program, and third, understanding and interpretation of the problem of defense management. I close by quoting again from the President's speech: "We must be ready and prepared."

Introduction of Dr. Whitman

Earl P. Stevenson, F.A.I.C.

President, Arthur D. Little, Inc., 30 Memorial Drive, Cambridge, Mass.

(Condensation of talk given on the occasion of the award of Honorary AIC Membership to Dr. Walter G. Whitman.)

WHILE at Massachusetts Institute of Technology, during his early period there, Professor Whitman published many papers in the fields of corrosion and absorption and had a major responsibility in the development of the two-film theory of absorption in the days when absorption was being put on a quantitative foundation for use by chemical engineers.

In 1926, Prof. Whitman left M.I.T. to go to the Standard Oil Company (Indiana) as a chemical engineer. In 1931, he became the associate director of research. During this period with Standard Oil he was the author of many reports and he is especially remembered for his studies in refinery economy. Prof. Whitman resigned from Standard in June, 1934, to become the head of the Chemical Engineering Department of M.I.T.

The continued growth and strength of chemical engineering, during his period there, is well-known throughout the chemical engineering profession. It is a common experience, often confirmed to me by the faculty members in chemical engineering at M.I.T., that when the question of intra-departmental relations arises, some non-chemical engineer will speak wistfully of the chemical engineering department and say, "It is their good luck in having Walter Whitman as their head."

During the war he was in Washington, on leave of absence, first as assistant chief and later chief of the Basic Chemical Division of the War Production Board. During a portion of that period he was chosen as the head of the Joint Service Committee to report on the status of jet propulsion developments in this country. In 1950, he became a member of the General Advisory Committee of the Atomic Energy Commission, a post of great responsibility, and one which he still holds. In 1948, he directed the AEC's Lexington Project, which was an appraisal of the possibilities of utilizing nuclear energy to power aircraft. There are many stories of that intensive summer's activities. Characteristically, Walter Whitman insisted on having an outdoor fireplace built for the relaxation of his staff during the noon-hour, and here they had many pleasant, sociable meetings.

In the spring of 1951, he accepted the chairmanship of the Research and Development Board of the Department of Defense. The chairman of this important board was the prin-

Prof. Whitman, Earl P. Stevenson, and AIC President Work.

cipal assistant to the Secretary of Defense in matters relating to development and research interests in the Department of Defense and as the personal advisor to the Secretary of Defense on technical matters.

When Professor Whitman started in this activity he was the chairman of the Committee with quite limited powers. At the end of the first year, Secretary Lovett recognized Whitman's special competence and need for increased authority, and changed his terms of reference so that Whitman, personally, was responsible for decisions on research and development. Thereafter, he used his committee as an advisory body to himself.

It is especially for this record in Washington and for these achievements that we meet on this occasion to do him honor.

Presentation to Dr. Whitman

PROF. WALTER GORDON WHITMAN, head of the Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, Mass., received Honorary AIC Membership, November 18th, at a meeting of the New England AIC Chapter held at the Faculty Club of M.I.T. A social hour preceded the dinner.

Dr. Walter P. Smith of Godfrey L. Cabot, Inc. presided in the absence of Dr. A. W. Fisher, Jr. chairman of the New England Chapter.

Prof. Whitman was introduced

by Earl P. Stevenson, president of Arthur D. Little, Inc., 30 Memorial Drive, Cambridge. AIC President Lincoln T. Work then presented the certificate of Honorary membership to Prof. Whitman, who responded with an address, "The Professional Man and Defense."

The citation to Prof. Whitman reads:

To WALTER GORDON WHITMAN

Distinguished chemical engineer, educator, and administrator, as exemplified by his service as head of the Department of Chemical Engineering, Massachusetts Institute of Technology, and as chairman of the Research and Development Board, Department of Defense; noted for his unfailing courtesy and consideration for his fellow man.

Promoted: Carl A. Setterstrom, F.A.I.C., from sales manager to general manager of the Textile Fibers Division of Carbide and Carbon Chemicals Company, 30 East 42nd St., New York, N.Y.

Please note: The first paragraph on page 432 of the September CHEMIST suffered an elision. Please add the italicized words below so that the paragraph reads: "Consider that most abundant of raw materials — air. Roughly eighty per cent of air is *nitrogen. About twenty per cent is* oxygen but in spite of its availability we have no really economic process of securing it."

New Address: For New York Offices of Hercules Powder Company: 380 Madison Avenue, New York 17, New York.

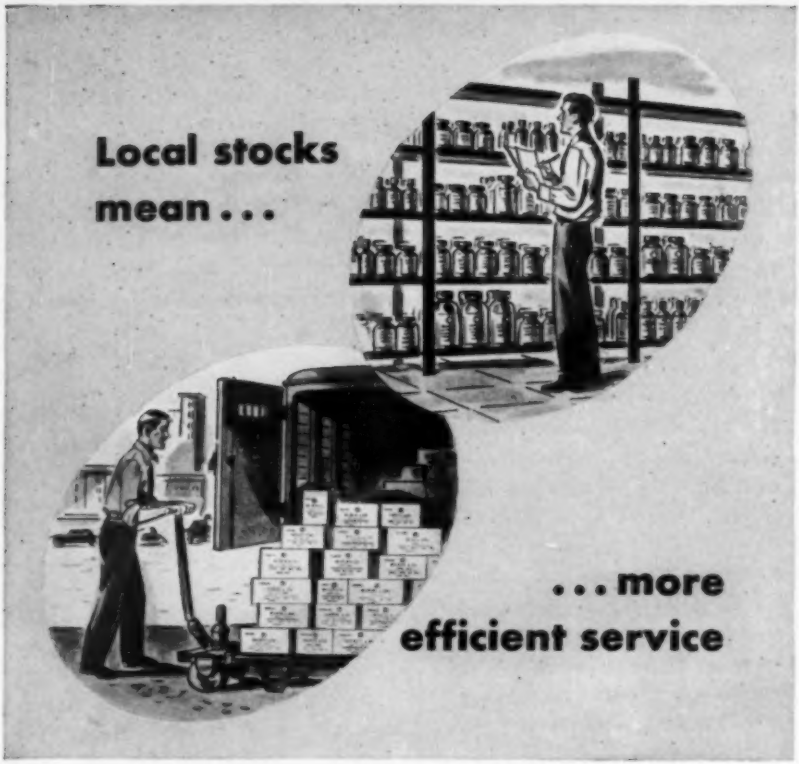
Basic Materials Conference: To be held in Chicago, May 17-20, at the International Amphitheatre. Registration cards may be obtained from Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N.Y.

British Industries Fair: To be held May 3rd to 14th in London and Birmingham, England. For information: British Information Services, 30 Rockefeller Plaza, New York 20, N.Y.

Sugar: The subject of the American Chemical Society, New York Section, meeting in January, was discussed by Dr. Henry B. Hass, F.A.I.C., president of Sugar Research Foundation, Inc., and Dr. F.W. Zerban, F.A.I.C., in charge of the New York Sugar Trade Laboratory.

Meeting: Of the American Oil Chemists' Society, to be held in San Antonio, Texas, April 12th to 14th. The sixth short course on "Inedible Fats and Fatty Acids," will be held at Lehigh University in mid-August.

Returned: From St. Croix, Virgin Islands, Dr. John A. Steffens, F.A.I.C., where he rehabilitated the Government House rum plant.



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How Chemists Have Developed the Field of Polyethylene

Roger Williams Jr., M.A.I.C.

President, Roger Williams Technical & Economic Services, Inc.,
148 *E. 38th St., New York, N. Y.*

(Condensation of a talk given at the Thirtieth Annual AIC Meeting, Philadelphia, Pa.)

POLYETHYLENE is chemically just what the name implies, a solid polymer of ethylene. Commercially the molecular weights range from about 2000 to over 23,000, but the majority of this waxy-feeling, relatively opaque plastic is produced in the 20,000 molecular weight range.

Polyethylene is (1) lighter than water — all other commercial plastics are heavier than water and so are the common metals. Since plastics are finally used on a volume basis, this gives polyethylene a competitive advantage; (2) possessed of a melting point just above that of boiling water; (3) inert to almost all chemicals at room temperature; (4) somewhat rubbery — that's where the squeeze bottle comes from; (5) possessed of excellent electrical properties; (6) excellent at very low temperatures; and (7) an excellent moisture vapor barrier.

It has relatively low tensile strength. Polyethylene pipe therefore cannot be used to carry liquids or gases at high pressures. Although it is an excellent moisture barrier, gases such as oxygen and carbon dioxide diffuse through a film or bottle rather readily. To illustrate, the squeezable feature of the bottles would make them ideal for packaging catsup. But the catsup maker must count on storage of his product for at least three years. During that time, enough oxygen gets through the walls of a polyethylene bottle to turn the catsup black. Polyethylene articles are not brilliantly transparent, though the transparency of thin films is being improved.

Few things will adhere to polyethylene, but to a great degree the problems of printing on polyethylene film and bottles have been solved.

High molecular weight polyethylene dates from 1933, when, almost by accident, researchers of the British Imperial Chemical Industries found that ethylene could be polymerized to a high molecular weight material, if the polymerization were carried out at pressures above 500 atmospheres, preferably in the 1,500-2,000 range. This led to the basic British patent on polyethylene as a new "composition of matter" in 1934 and a corresponding basic U.S. patent (2,153,553) issued April 11, 1939.

The initial polymers produced in 1933 and 1934 were investigated to determine the physical and electrical properties of the polymer. The electrical properties were remarkable, particularly the power factor which varied but little with temperature.

The British development of radar with its weak high-frequency electrical impulses, required a wire insulation with an extremely low power factor — the obvious material, polyethylene. So ICI began the commercial production of polythene (its coined name for polyethylene) in 1939.

Work was begun almost concurrently in the United States by du Pont's Ammonia Department and Carbide and Carbon. Carbide did not have the background experience developed by ICI but had the benefit of many years of work with ethylene, which du Pont did not have. With such different backgrounds, du Pont and Carbide developed different processes. Both rushed through the pilot plant stage and designed small commercial plants financed by the U. S. Navy. The different processes resulted in slightly different polymer properties.

By the end of the war, both du Pont and Carbide appreciated polyethylene's tremendous market potential, for film, pipe, coatings, and electrical uses. Both plunged ahead with expansions which have resulted in a current production rate nearly ten-times the peak wartime output, and both companies are planning new increases in capacity.

A recent anti-trust suit against du Pont, ICI, and other related companies, has resulted in a decision which forces du Pont and ICI to license their polyethylene patents and supply production know-how to all comers on a "reasonable royalty" basis. The decree, not appealed, opened up the possible production of polyethylene to essentially any company.

Polyethylene Production

Production begins with quite pure ethylene. The only impurities allowed are nitrogen and saturated hydrocarbons. Unsaturates, carbon monoxide, hydrogen, etc., will co-polymerize. If unreacted ethylene is to be recycled, the total volume of impurities in the make-up gas must be low, generally less than 0.5 per cent. Production is not a simple operation. It requires the highest pressure of any commercial chemical process now in use — 22,000 to 35,000 pounds per square inch.

Practically no process data are available except in the patents. From these, and other sources, it is believed that Carbide polymerizes at about 2,000 atmospheres without liquid diluents. Conversion is roughly 25 per cent and Carbide apparently does not recycle the unreacted ethylene, converting it to oxide, alcohol, or some other ethylene derivative. Du Pont operates with diluents, apparently water and benzene, at about

1,500 atmospheres and does recycle unreacted ethyelene.

Polyethylene plants are not cheap, due in great part to the high pressures involved. ICI estimates that a plant to produce 17 million pounds per year would cost $11,000,000 exclusive of the investment required for ethylene production. The plant being built by Canadian Industries Limited in Canada is estimated to cost $13,000,000 for 12-million pounds. This figure includes an ethylene plant and provisions for doubling capacity.

Currently polyethylene sells at 44 cents per pound, with a sizeable margin of profit. Many experts feel that the price will drop to between 35 and 40 cents in the next five years. Polyethylene potentially is cheaper than any of the more common thermoplastics, Table I. The thermosetting resins are cheaper but not directly competitive.

Table I

Plastic	*Typical Price ¢/lb.*	*Typical Specific Gravity*	*Volume* Comparison*
Polyethylene			
current	44	0.92	40
potential	35	0.92	32
Polyvinyl Chloride	38	1.39	53
Polystyrene	33	1.06	35
Phenolics	20	1.36	27

*Represents price in cents per pound times specific gravity actually represents the cents per 27.7 cubic inches.

Producers and Capacities

Present production capacity in the United States for polyethylene is estimated at 125 million pounds per year, about equally divided between du Pont and Carbide. Table II shows an estimate of existing and planned capacity for the end of 1956.

Table II

Company	*Capacity Million Pounds per Year*	*Source*
Carbide	250	(2)
Du Pont	100	(1)
National Petro-Chemical	50	(1)
Spencer Chemical	45	(2)
Texas Eastman	20	(1)
Monsanto Chemical	66	(2)
Dow Chemical	20	(1)
Total	551	

(1) *Chemical Week*, Mar. 21, 1953
(2) Company news release or statement.

Since there have been only two producers, no accurate production statistics are available. Various estimates of past production are shown in Table III.

Table III

Year	*Production Million Lbs.*
1943	1
1944	2.5
1946	9
1947	10
1948	16
1949	30
1950	60
1951	75
1952	90
1957 (estimated)	550-600

Polyethylene Markets

Since the inception of commercial polyethylene production, the markets have been determined by military demand. With only brief exceptions, po-

lyethelene supply has been short of demand. Hence there is not a "normal" market pattern. The best statistics available are those for the allocation of polyethylene by the National Production Authority. During the first four months of 1952, approximately one-third went to the military; roughly one-third to supported civilian uses (wire and cable, communication, packaging, mine pipe and rubber), and the remaining was free. Of the military allocations, 17 per cent was used for packaging purposes. Of the free material, almost three-quarters went into packaging. Approximately one-third of the current output is being used by the military, despite the fact that supplies increased enough to remove polyethylene from formal allocation last Fall. The current distribution is probably 35 per cent film and coating, 10 per cent pipe and bottles, 40 per cent electrical, and other, 15 per cent.

Film and Coating: Polyethylene film is less expensive than some grades of Cellophane, although it is not as clear or brilliant. In the long range future it should cost less than any grade of Cellophane. One of the biggest markets for the film is in prepackaging fresh produce; apples, carrots, onions, potatoes, etc. Another is in the "pillow" package for frozen orange juice, developed for Pasco and Walgreen's, and being developed for all kinds of products, liquids, and solids. Here the polyethylene film is usually laminated to another film, like cellophane. Meats and frozen poultry are also packaged in polyethylene. With the increasing trend toward frozen foods and prepackaging, this consumption should grow rapidly. Films also find such diverse outlets as shelf-lining, painters' drop cloths, automobile spring inner-liners, garment bags, and packaging entire stalks of bananas and whole carcasses of meat.

Paper coated with polyethylene-wax-blends packages much bread. Many products are being shipped in multi-wall bags, polyethylene lined or coated to keep out moisture. And many products are shipped in polyethylene-lined or coated fiber and metal drums.

Bottles: Despite high cost, close to 150-million "squeeze bottles' were produced in 1952. The 1953 figure should reach 250-million. Initial applications of the bottles have been to "gimmick" appeal, where squeezability made product application easier, or where corrosion resistance was a factor. HF is being packaged for laboratory use in polyethylene bottles. Polyethylene carboys are being used for acids like nitric, sulphuric, and hydrochloric.

Pipe: Polyethylene pipe is used for piping acidic mine water, as in the Eastern bituminous coal fields. It is quite corrosion resistant. Other uses include farm irrigation and for lead-

in lines for jet wells. It is cheaper than copper pipe.

Electrical: Electrical outlets still consume a larger percentage of the polyethylene produced than any other. Major uses are tied to the military and involve insulation of Army field wire. Co-axial cable (for television transmission) and the familiar TV lead-in wire from the aerial to the set, also use polyethylene.

All Other: Thousands of other potential uses include non-toxic, unbreakable toys, refrigerator trays, shoe counters, as examples. Polyethylene can also be treated chemically to make a synthetic rubber (chlorosulphonated polyethylene) that may have promise as a specialty rubber. These "all other" uses, including many unconceived today, may overshadow any specific category in the consumption of polyethylene.

Polyethylene is just twenty years old this year. In that time, despite the problems of extreme pressure in production processes, the polymer has grown from a laboratory curiosity to a major plastic. Now, its output is going to multiply some five times in less than five years. Various people have guessed polyethylene will be the first billion pound plastic; we think it will be too.

Moved: The Fleischmann Laboratories, Standard Brands Incorporated, from New York, N. Y. to Betts Ave., Stamford, Conn.

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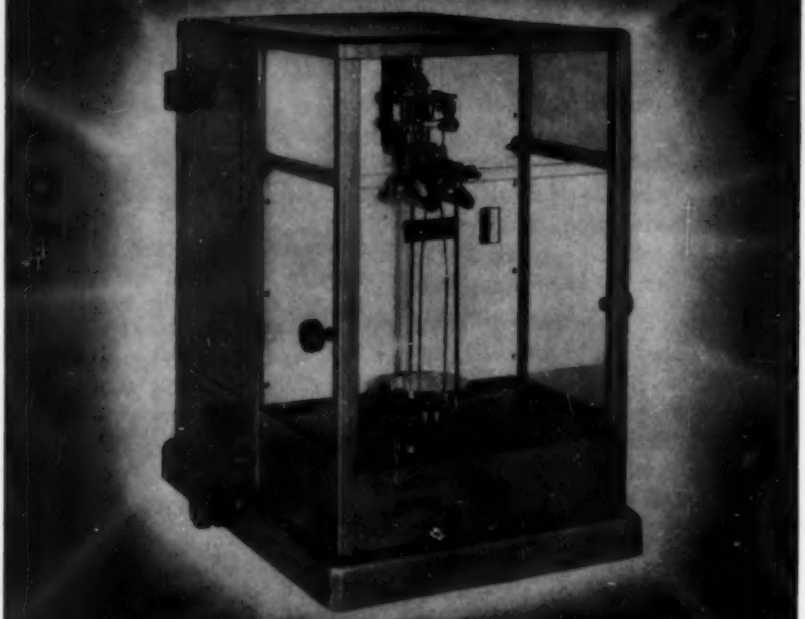
Scientific Congress: With Exhibition, to be held in Paris, France, June 14th to 19th, by L'Aluminum Francais and La Societe Chimique de France, to celebrate the centenary of the first production of industrial aluminum in France by Henry Saint-Claire Deville. The U.S. Bureau of Mines has been asked to call this Congress to the attention of interested scientific societies in this country, so that their members may submit papers or otherwise participate. Programs and information may be obtained from R. Gadeau, The Secretary, L'Aluminum Francais, 23 Rue Balzac, Paris (8e), France.

New Position: Richard B. Mitchell, F.A.I.C., now with B.T. Babbitt, Inc., Albany 1, N.Y. He was formerly with the American Institute of Laundering, Joliet, Illinois.

Promoted: Shepherd Stigman, M.A.I.C., to assistant to the director of personnel and public relations of Foster D. Snell, Inc., 29 West 15th St., New York 11, N.Y. He joined the company in 1951 as a radiochemist.

A New Star is Born...



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Greetings Presented to the Chemical Society of Japan

TO THE seventy-fifth anniversary meeting of the Chemical Society of Japan, celebrated October 10th to November 10th, Dr. Gustav Egloff, Hon.AIC, of Universal Oil Products Company, Des Plaines, Ill., brought greetings from THE AMERICAN INSTITUTE OF CHEMISTS, the American Chemical Society, and The American Institute of Chemical Engineers. These were presented at special ceremonies held at the Tokyo National Museum, October 29th.

During the celebration, Dr. Egloff spoke at Tohoku University, Sendai, on "Catalytic Cracking; at Osaka Cotton Industry Club, Osaka, on "Catalytic Reactions in Oil Refining"; at the Japan Industry Club, Tokyo, on "The Platforming Process," and at Tokyo University, on "Chemicals from Petroleum."

Sir Robert Robinson, professor of chemistry, Oxford University, England, lectured on "Structural Relations of Some Natural Products," and "Discussions on Terrestrial Chemistry," and brought messages from the Chemical Society and the Royal Society of London.

Dr. Walter Reppe of Germany, noted for his work on acetylene chemistry, spoke on "Acetylen und Kohlenoxyd, Bausteine der modernen Chemie der Kunststoffe und vollsynthetischen Fasern," "Wissenschaft und Technik in der deutschen chemischen Industrie," and "Forschen, Erfinden, und technisches Gestalten—Gedanken zur Arbeit des Chemiker in der Industrie." He brought greetings from Gesellschaft deutscher Chemiker, Europaedische Federation fur Chemie und Ingenieurwesen and DECHEMA.

The Chemical Society of Japan was founded April 26, 1878. Prof. Ryuzaburo Nodzu, of Kyoto University, is president. Publications of the Society include the *Bulletin* (in European languages); the pure chemicals section and the industrial chemicals section of the *Journal,* and *Chemistry & Industry*—these in Japanese.

The president of the Science Council of Japan, Naoto Kameyama, who was chairman of the Committee for the Celebration, wrote to AIC President Work:

> "The 75th Anniversary Celebrations of the Chemical Society of Japan have been successfully concluded, and I am writing to you on behalf of the Celebration Committee to thank you for the very kind and dignified Message with which you honoured our happy event. The Message was read during the Anniversary functions by Dr. Gustav Egloff, and added much to the prestige of the occasion.
>
> "I beg to take this opportunity to express our heartfelt appreciation of your kindness in sending your Message to us and sincerely hope that it may prove to mark

On left, Prof. Modzu, president, Chemical Society of Japan. Third from left, Dr. Walter Reppe; fourth, Sir Robert Robinson. Speaker, Dr. Egloff.

the beginning of very intimate relations between our two organizations."

The AIC scroll presented by Dr Egloff at the Anniversary reads:

GREETINGS

from The American Institute of Chemists to the Chemical Society of Japan on the occasion of its Seventy-fifth Anniversary. The members of The American Institute of Chemists congratulate the Chemical Society of Japan on its seventy-five years of fruitful service, and they offer best wishes with confidence that the Chemical Society of Japan, through the science of chemistry, with bring great benefits to all peoples.

—LINCOLN T. WORK
President

Research Specialist: A new employee classification established by the Dow Chemical Company, Midland, Mich., to give recognition for research ability equal to that afforded by administrative classification. Creation of the new title, according to Dr. R. H. Boundy, director of research, gives expression to the company's long-maintained principle that exceptional research ability is of equal importance with exceptional supervisory ability. It is expected that this action will encourage the choice of research as a career.

Announced: By Dr. Russell M. Pickens, F.A.I.C., vice president in charge of sales for Rayonier Inc., New York 17, N.Y., the appointment of Dr. George B. Creamer as manager of technical services.

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The Ohio AIC Chapter Describes "The Chemist" on TV

The Cleveland Technical Societies Council and its forty member-societies present "Adventures in Engineering" weekly on WNBK. The ninth program, entitled, "The Chemist" was presented by the Ohio Chapter of The American Institute of Chemists, with Dr. Edward G. Bobalek, F.A.I.C., of Case Institute of Technology, acting as AIC host and coordinator.

Participants in the program were Dr. Norbert A. Lange, of Handbook Publishers, Inc., chairman of the Ohio Chapter; Dr. David M. Gans, F.A.I.C., and Mr. Brazet of the Arco Company, and Brecksville High School students, Carl Neu and John Barth.

Students who want to know whether they should seek careers in science will be interested in the summary of desirable aptitudes given by Dr. Bobalek in this brief outline of the thirty-minute program:

The scene opens with Carl and John mixing at random the contents of bottles "to discover something . . . like a chemist." Mr. Brazet halts them and they go to see Dr. Lange to find out "What is a chemist?" Dr. Lange answers, "Obviously a chemist is one who understands the science of chemistry. Chemistry is that branch of learning that is concerned with the composition of all substances and the changes that can happen in composition." The students find out about substances, elements, energy changes, the periodic chart, and what goes into the voluminous chemical literature.

Lange: His (the chemist's) job is to . . . know (1) What he is looking for, (2) where to look, (3) how to understand what he has found, (4) how to use what he understands . . . The other big job of a chemist is to use what is known, as a stepping stone, from which to start his exploration of things yet unknown.

The students then visit a director of research, Dr. Gans, and ask him, "What is Research." They are shown a plastics display as a demonstration of the end product of some researches, and told about the work of the chemist in basic research, in applied research, in development; the work of the chemical engineer; the activities of chemists who take up management, production planning, purchasing, sales, or patent work.

The students ask, "How do chemists do their work?" They are then introduced to such analytical tools as the balance, the micro balance, the mass spectrograph, the electro microscope, other apparatus, and slides showing laboratories in which these tools are used.

The next question, "How does one

become a chemist?" They go to Dr. Bobalek:

Dr. Bobalek: Are you the stuff out of which good chemists are made? (1) Are you curious? Do you like to ask the question How? Why? Things happen . . . Do you try to imagine reasons for things that happen? Afterward are you inclined to make some effort to find out if your guesses are correct?

(2) Perseverance. Do you take on hard jobs. For example, some school activities like athletics, school yearbook, school plays, and so on, and stay with them even when the going is rough and sometimes dull because you know the final result is worth it?

(3) Are you in at least the top half of your class?

(4) Have you done well in high school mathematics and the sciences?

(5) Do you like to read? Are you in at least the top half of your class in English?

(6) Have you some mechanical aptitude? That is, do you like to work on the car, on a radio, or build things with tools?

If you can rate yourself good on the first two and fair to good on the others, you are an excellent prospect for chemistry or any science. Now you can go to college with confidence and start learning to be a chemist.

The importance of studying other subjects in addition to chemistry was also pointed out, and Dr. Bobalek mentioned some research fields for the future. He closed with "There are unlimited opportunities for centuries to come for the talents of young men like yourselves in both basic and applied research to improve the materials and with it the spiritual wealth of man."

Speaking Schedule: Dr. Gustav Egloff, Hon.AIC., spoke January 19th to the student body of the Georgia Institute of Technology, Atlanta, Georgia, on "The Engineer in the Oil Industry," and to the local section of the American Institute of Chemical Engineers on "The Future of the Petrochemical Field." On February 4th, he speaks before the Argone National Laboratory branch of the Scientific Research Society of America, Lemont, Ill., on "Energy Resources." On February 19th, he addresses the Charleston Open Forum, Inc., Charleston, West Virginia, on "The Impact of Petroleum and Natural Gas on the Economy and Welfare of our Nation."

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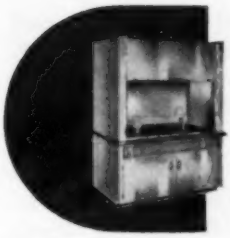

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"The achievements of the research engineer are necessary to social and cultural progress, despite the fact that he is primarily preoccupied with the material world," Dr. Harold K. Work, F.A.I.C., director of the research division College of Engineering, New York University, stated in a report on the ten-year operation of the Division. "Whatever the research engineers' immediate objectives, his ultimate function is to fight poverty, disease, and famine, to raise living standards, to combat ignorance and violence, and to provide the degree of leisure and security essential to human welfare."

New Position: For Dr. Francis R. Holden, F.A.I.C., who has joined the chemistry staff of Stanford Research Institute, Palo Alto, Calif. He was formerly with the U. S. Naval Radiological Defense Laboratory, San Francisco.

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Communications

To Be Reprinted

To the Editor:

In the December issue of THE CHEMIST you ran a short article by M. R. Bhagwat entitled, "Some Things We Learned about Chemists." We would like to reprint this in our *Journal,* giving full credit to your publication . . .

—M. G. DE NAVARRE,
Society of Cosmetic Chemists.

Growth

To the Secretary:

When I joined the AIC in 1924 through the efforts of Dr. M. L. Crossley, it was a very young and struggling group. In the meanwhile it has grown and assumed its rightful place in the industry and anyone can be proud to be a member.

—W. O. BREWER, F.A.I.C.

Recommends Orchids

To the Secretary:

Since my retirement, the greatest single expenditure of my time goes to my Epiphyllum hydridizing work, and has already resulted in registry of the names of two new varieties. I certainly can recommend Epiphyllums, Anthuriums and Orchids as satisfying hobbies. I brought a Cattleya orchid into the house last week which had thirty blossoms out, and they probably will last close to a month.

—RALPH C. SHUEY, F.A.I.C.

New: The first reinforced plastic semi-trailer tank transport designed for commercial transportation of bulk liquids in the United States. A one-piece molded structure, to hold 3,400 gallons, it will be used by P. B. Mutrie Motor Transportation, Inc., Waltham, Mass., to haul formaldehyde, etc. It is made of American Cyanamid Company's Laminac Polyester Resin and fibrous glass reinforcement by the Carl N. Beetle Plastics Corporation.

Appointed: Raymond Szymanowitz, F.A.I.C., as vice president and a director of Acheson Industries, Inc., Port Huron, Mich.

Appointed: George F. Sharrard, F.A.I.C., as administrative assistant to the director of sales development of Chas. Pfizer & Co., Inc., Brooklyn, N. Y. He was formerly with the Westvaco Chemical Division of Food Machinery and Chemical Corporation.

The Year 1954: Will be a big and busy one for industrial research, it is predicted by Dr. Haldon A. Leedy, director, Armour Research Foundation of Illinois Institute of Technology. Industry will relay more heavily upon research to develop new materials and processes to improve its products and cut costs.

Awarded: To Prof. Robert Ginell, of the Department of Chemistry, Brooklyn College, Brooklyn 10, N.Y., the 1953 A. Cressy Morrison Prize of the New York Academy of Sciences, for his paper, "A General Theory of Association." It will be published in the *Annals of the New York Academy of Sciences.*

Resident Fellowships: Of $1700 each, in biology, chemistry, geology, and physics, at Bryn Mawr College, open to women who have completed a year of graduate work. Also Scholarships and Fellowships, $1000 to $1700, open to men and women in biochemistry, biophysics, chemical physics, geochemistry, geophysics, and psychophysics. Postdoctoral Fellowship in physics or chemistry, $3200, to candidate who holds doctor's degree. Several demonstratorships of $1350 to both men and women. For information, write Graduate Office of Bryn Mawr College, Bryn Mawr, Pa. Applications are due March 1. 1954.

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National Council Meetings

Meetings of the AIC National Council are scheduled to be held at The Chemists' Club, 52 East 41st St., New York, N. Y., at 6:00 p.m., on the following dates:

Mar. 10, 1954
Apr. 14, 1954
May 12, 1954 — Asbury Park

New Position: For Ralph Lamenzo, F.A.I.C., as administrative assistant for the A.C. Horn Company, division of the Sun Chemical Co., 10th Street and 44th Ave., Long Island City, N.Y., manufacturers of paints, varnishes, finishes and waterproofing compounds. He was formerly with H.B. Davis Co., of Baltimore. He was also chairman of the Baltimore AIC Chapter.

AIC Activities

C. P. Neidig, F.A.I.C.

Baltimore Chapter

Acting Chairman, Dr. Leonard Rice
Secretary-Treasurer, J. Bernard Edmonds
Representative to National Council,
Dr. Albin H. Warth

Plant Tours

The Baltimore Chapter sponsored two tours on different days through the Titanium Division of the Glidden Company this fall. The tours dealt with the treatment of ilmenite or a titanium slag as a raw material. Step by step, the processing of this material was followed until the finished product, white titanium dioxide pigment, was obtained. Included in the tours were the inspection of the various laboratories that deal with the research and control of this product. The tours were well attended and proved very educational.

New Jersey Chapter

Chairman, Dr. J. B. Allison
Chairman-elect, Dr. H. W. Mackinney
Treasurer, Dr. W. A. Raimond
Secretary, Dr. W. R. Sullivan
Representataive to National Council
P. J. Gaylor

Energy Sources of the Future

The January 19th meeting of the New Jersey Chapter was "Ladies' Night." After a brief business period, the meeting was addressed by Dean Elmer C. Easton of the College of Engineering, Rutgers University, on "Energy Sources of the Future." In a very entertaining manner, Dean Easton brought home the immensity of America's energy requirement by numerous homely examples. For instance, all the horses we could raise on the U.S.A.'s one-billion acres (one horse per acre) would develop only 1.25 per cent of the 384 quadrillion BTU's we shall resuire one-hundred years from now. A tenfold increase in our present water-power sources would produce only about one per cent of this requirement. Nuclear fission and nuclear fusion reactions are potent new sources awaiting control and development. Nuclear fission coupled with the breeding reaction is especially promising. Among the areas suggested for study are the development of more effective thermopiles, photovoltaic apparatus, and methods of capturing, storing and utilizing solar energy.

Plans for the 1954 Annual Meeting were reviewed by Chairman David Young. The Chapter is particularly proud that Dr. W. J. Sparks, Standard Oil Develpment Company, has been chosen to receive the AIC Gold Medal for 1954.

Committees Appointed

At the December meeting of the Washington Chapter, the following chairmen of Committees, for the year, were appointed:

Membership Committee: Paul Gomery
Award Committee: Dr. Gordon Kline
Program Committee: Louis Markwood
Civil Service Committee: Blodget Sage
Employment Committee: Arthur Schroder

New York Chapter

Chairman, Karl M. Herstein
Vice Chairman, Savery F. Coneybear
Secretary-treasurer, Richard L. Moore
Representative to National Council,
Dr. M. J. Kelley

Student Award Meeting

Dr. Cornelius P. Rhoads, director of Sloan-Kettering Institute for Cancer Research will be the speaker at the Annual Student Award Meeting of the New York Chapter, Thcrsday, March 4, 1954, at the cafeteria of Union Carbide and Carbon Corp., 30 East 42nd St., New York, N. Y.

"Rational Cancer Chemotherapy" will be the subject of the talk by Dr. Rhoads, who is also scientific director of Memorial Center for Cancer and Allied Diseases. The other feature will be the annual awards to outstanding chemistry students in colleges in the New York area.

Newsletter

The New York Chapter is the first to start publication of a newsletter to its members. Vol 1, No. 1, was issued in January by Samuel Cohen, editor. The Newsletter Committee, consisting of Samuel Cohen, Bernard F. Idson, Mark M. Lukens, and Florence E. Wall, announced

that "The purpose of this *Newsletter* is to let you know what we have been doing and what our future plans are. We hope in this way to show you how all of us can take a more active part in the organization for our mutual benefit . . . We want this letter to be a medium of exchange in which we can circulate personal or professional notes as well as any views of our members which may be of common interest."

In a message of Greetings, Karl M. Herstein, Chapter chairman, states, "This *Newsletter* is one possible expedient by which your officers and council are trying to build interest in the INSTITUTE. There is no doubt that there is a need for the INSTITUTE to formulate and bring into use, all those things that are for the betterment of the chemical profession. The INSTITUTE would not have existed for almost thirty years if that were not the case. It would not have attracted the long list of distinguished and successful chemists who are included in its membership if it did not serve a beneficial end. Particularly, it would not have enlisted the volunteer, unpaid, and frequently unthanked, efforts of the long succession of workers who have carried the INSTITUTE along all these years . . . We hope this *Newsletter* will prove a useful tool in this direction."

Suggestions for an acceptable name for the new publication are solicited. The person who submits the chosen title will receive a prize of a chemical dictionary.

Young Chemists' Meeting

Over two-hundred young chemists and INSTITUTE members attended the meeting of the New York Chapter held at Ruppert's Brewery, 1639 Third Ave., New York, N. Y., on January 7th. Preceding the meeting, they joined tours through the modern plant, agleam with copper and stainless steel tanks, controlled by a maze of piping, meters and valves, in room temperatures ranging from hot-humid to cold-dry. They collected little samples of fragrant hops and then met in the Tap Room to sample the plant's end products, beer and ale, and to hear Professor Benjamin Harrow, chairman of the Chemistry Department of the City College of New York, give an excellent talk on "Exploring the Frontiers of Chemistry" as applied especially to biochemical reactions.

Dr. Henry B. Hass, former chairman of the New York Chapter, spared no exertion in leading the group singing. He was assisted by Karl M. Herstein, present Chapter chairman. Columbia, Fordham, CCNY, NYU, St. Johns, Brooklyn Polytechnic, St. Peters, Manhattan, Long Island College, and Adelphi students challenged each other with school songs, accompanied by an accordionist. When Dick Moore, Chapter secretary, finally concluded the meeting by leading with the singing of "Auld Lang Syne", those present concurred that they had had an unforgettably good time, and joined in giving thanks to Ruppert's for the meeting place and the beverages which included a most commendable stock ale. Gordon Morrow of Ruppert's acted as a truly gracious host. Shepherd Stigman was chairman of the Chapter's Committee on Arrangements.

Ohio Chapter

Chairman, Dr. Norbert A. Lange
Chairman-elect, Dr. David M. Gans
Secretary-Treasurer, Harold M. Olson
Council Representative, Dr. Malvern J. Hiler

Committees Appointed

The following Committees have been appointed by the Ohio Chapter:

Committee for Accrediting Colleges and Universities in the Ohio Chapter: Joseph H. Koffolt, Otis D. Cole, and Elton S. Cook. (An interesting sidelight in the discussion was a statement by Dr. Koffolt that over 300-companies had contacted Ohio State University since October to arrange for interviews with prospective chemists and chemical engineers.)

Ohio Award Committee: Otis D. Cole, Games Slayter, and Leslie J. Todd.

Nominating Committee: Elton S. Cook, Gordon M. Juredine, and George F. Rugar.

Districts

The established districts of the Ohio Chapter are:

Akron District: Summit, Medina, Wayne, Stark, and to Portage Counties.

Cincinnati District: Hamilton, Butler, Warren, and Clermont Counties.

Cleveland District: Cuyahoga, Lorain, Lake and Geauga Counties.

Columbus District: Franklin, Delaware, Union, Madison, Pickaway, Fairfield, and Licking Counties.

Dayton District: Montgomery, Preble, Drake, Miami, Clark, and Greene Counties.

District at Large: All other counties in Ohio.

Kentucky-Tennessee District: The entire states of Kentucky and Tennessee.

Washington Chapter

Chairman, Alexander Leggin
Vice-chairman, P. E. Reichardt
Treasurer, John Williams
Secretary, Wesley Koster
Representative to National Council, Alexander Leggin

January Meeting

The Washington Chapter met January 12th at a luncheon at Bonat's Restaurant, Washington, D.C. Paul Gomery reported on the work of the Membership Committee.

James E. Bacon, of the Jefferson Lake Sulfur Company, spoke on the "Mid-Century Conference on Resources for the Future," held in Washington, D.C. early in December. Mr. Bacon's comments aroused considerable discussion on the merits of the Conference, many members present themselves having attended and formulated their own opinions.

Will You Come

Feb. 2, 1954. Western Chapter. Social. Evening. Buffet Supper. 6 to 10 p.m. Pabst Brewing Co. Los Angeles, Calif.

Feb. 4, 1954. Pennsylvania Chapter. The Engineers' Club, 1317 Spruce St., Philadelphia. Speaker, Dr. Roy J. Plunkett, F.A.I.C., manager Engineering Section, Organic Dept. E. I. du Pont de Nemours & Co. Subject, "Teflon, Development and Uses."

Feb. 9, 1954. Washington Chapter. Luncheon meeting, for the transaction of Chapter business.

Feb. 26, 1954. Chicago Chapter. Engineers Club, 314 South Federal St., Chicago, Ill. Speaker, Dr. M. J. Mack, "Employment Problems of Chemists Over Forty." Reservations: Ed Rankin, Research Division, Armour & Company, 1425 West 42nd St., Chicago, Ill.

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Mar. 4, 1954. New York Chapter. Cafeteria of Union Carbide & Carbon Corp., 30 E. 42nd St., New York, N. Y. Student Award Meeting. Dinner 6:00 p.m. $2.75. Social hour follows meeting. Speaker, Dr. Cornelius P. Rhoads, director of Sloan-Kettering Institute for Cancer Research. Subject, "Rational Cancer Chemotherapy." For information: Dr. Murray Berdick, Coordinator of Research, Evans Research & Development Corp., 250 E. 43rd St., New York 17, N. Y. (MU 3-0071).

Mar. 24, 1954. AIC Luncheon in connection with the 125th National Meeting of the American Chemical Society, Kansas City, Missouri. 12:15 p.m.

Mar. 30, 1954. AIC Luncheon in connection with the 125th National Meeting of the American Chemical Society, Kansas City, Mo., 12:15 p.m. AIC members who are attending the ACS meeting are cordially invited to include these two luncheons in their schedules.

April 2, 1954. Chicago Chapter. Chicago Engineers' Club, 314 So. Federal St., Chicago, Ill. "Mixer" at 6:00 p.m. Dr. Charles C. Price, F.A.I.C., Head, Department of Chemistry, University of Notre Dame. Subject, "Science, Power and Freedom."

April 9, 1954. Ohio Chapter. Annual Meeting. Brown Hotel, Louisville, Kentucky. Plant Trip, Business Meeting, Presentation of Ohio Award. For details of this full-day program: Harold M. Olson, The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.

May 12, 13, 14, 1954. AIC Annual Meeting. Berkeley Carteret Hotel, Asbury Park, N.J. Award of the 1954 Gold Medal to Dr. William J. Sparks. Honorary Chairman, Dr. Randolph T. Major. General Chairman, David W. Young; Chairman of Arrangements, Dr. A. Scott; Treasurer, Dr. W. A. Raimond; Chairman of Registration, Chester A. Amick; Chairman of Publicity, L. T. Eby; Chairman of Special Events, Dr. W. R. Sullivan; Chairman of Program Committee, Dr. Max Bender.

May 12, 13, 14, 1955. AIC Annual Meeting. Chicago, Illinois. The Chicago Chapter has appointed Clifford A. Hampel to initiate arrangements.

May, 1956. AIC Annual Meeting. Tentatively scheduled for Washington, D.C.

To AIC Members Who Travel

The INSTITUTE has twelve Chapters, located in various sections of the country. AIC members who are traveling may enjoy attending Chapter meetings and making friends in other areas. Therefore, the names and addresses of the Chapter secretaries or other officers are given here. Please get in touch with any of them to find the dates of special meetings at the time you will be in the vicinity.

Alabama

Chairman, Dr. Stewart J. Lloyd, Chemistry Dept. University of Alabama, Birmingham, Alabama

Baltimore

Secretary-Treasurer, J. Bernard Edmonds, 3816 Greenmount Ave., Baltimore 18, Maryland

Chicago

Secretary, John Krc, Jr., Armour Research Foundation, Technology Center, Chicago 16, Illinois. (CA 5-9600, Ext. 750)

Louisiana

Secretary-Treasurer, H. A. Schuyten, 329 Audubon St., New Orleans 15, La.

New England

Secretary-Treasurer, Richard S. Robinson, Arthur D. Little, Inc., 30 Memorial Drive, Cambridge, Mass.

New Jersey

Secretary, Dr. W. R. Sullivan, Hoffmann-La Roche, Inc., Nutley 10, N. J.

New York

Secretary-Treasurer, Richard L. Moore, Foster D. Snell, Inc., 29 W. 15th St., New York 11, N. Y. (WA 4-8800)

Niagara

Secretary-Treasurer, Theodore E. Gilbert, 354 East Utica St., Buffalo 11, N. Y.

Ohio

Secretary-Treasurer, Harold M. Olson, The Harshaw Chemical Co., 1945 East 97th St., Cleveland 6, Ohio.

Pennsylvania

Secretary-Treasurer, John H. Staub, Barrett Division, Allied Chemical & Dye Corp., Margaret & Bermuda Sts., Philadelphia 37, Pa.

Washington

Secretary, Wesley Koster, National Production Authority, Washington 25, D.C.

Western

Secretaries Miss Blanche C. Simons, 718 North Fairfax Ave., Los Angeles 46, Calif.
Tom Rollins, Keldon Research, Los Angeles 54, Calif.

Opportunities

Doris Eager, M.A.I.C.

AIC members who are seeking positions may place notices in this column without charge.

Positions Available

General Sales Manager: Chemist, generally familiar with Agricultural Chemical industry. To participate with President and Technical Director in formulating general company policy. Responsible for all Sales, Sales Promotion, Advertising and Merchandising activities. To manage the sale of existing products and develop plans for introduction of new products, including channels of distribution, types of customers, method of sale. Age 35-45. Eastern Seaboard. Base salary, depending on background and experience, up to $14,000. Box 21, THE CHEMIST.

Positions: At the new Research & Development Laboratories, QM Research & Development Center, Natick, Mass.:

GS-13, $8360: Supervisory Chemist, (Adhesives, Section Chief); Supervisory Chemist (Protective Finishes, Section Chief); Supervisory Technologist (Paper & Paper Products, Section Chief).

GS-12, $7040: Technologist (Test Coordinator, Chief).

GS-11 $5940: Chemist (Protective Finishes): Biologist (Insecticides and Rodenticides); Physicist (Materials Evaluation); Chemist, (Films, Filaments and Coated Fabrics); Physicist (Personnel Armor); Technologist (Specifications Office).

GS-9, $5060: Technologist (Films, Filaments and Coated Fabrics); Chemist (Insecticides & Rodenticides); Technologist (Paper & Paper Products).

GS-7 $4205: Chemist (Chemicals & Chemical Processes); Chemist (Fungicides & Germicides).

Request Form 57 from Department of the Army, Office of the Quartermaster General, Washington, D.C., and forward it to the Civilian Personnel Office at the above Laboratories.

Positions: U. S. Naval Ordnance, California:

Physicist, GS-11 or GS-12, directing research in thermodynamics, fluid dynamics, physical metallurgy, effects in solids produced by high dynamic loading, infra-red spectroradiometry, physical and geometrical optics, or solid state research.

Physicist GS-12 or GS-13, conduct research in field of exterior ballistics of rockets.

Metallurgist, GS-12, conduct metallurgical studies in field of warhead exploration.

Chemist, GS-11 or GS-12, conduct research in field of inorganic coordination compounds, their synthesis, and study of physical properties. Ph.D. or equivalent.

Chemist GS-11 or GS-12, conduct research in infrared absorption spectroscopy and study of structures of organic compounds. Ph.D. or equivalent.

Apply U. S. Naval Ordnance Test Station, Inyokern, China Lake, California.

Analytical Chemists: B.S. to Ph.D. with or without experience. Personnel Office, Colgate-Palmolive Co., 105 Hudson St., Jersey City, N. J.

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Chemists Available

Pharmaceutical Chemist: F.A.I.C. B.S. in Pharmacy; Ph.D. (1945) Organic Chemistry. Diversified experience, including supervisory, in the synthesis and development of pharmaceuticals from the laboratory through full scale production, including formulation work. Publications. Age 33, family. Desire challenging opportunity with good growth potential. Box 20, THE CHEMIST.

Chemical Executive: Consultant. Seeks challenging position to make full use of administrative ability — scientific and business knowledge in plastics, resins, pharmaceuticals, foods, etc., fields. 14 years of progressively difficult experience. Past 9½ years Director of a Chemical Laboratory conducting research-development, product evaluation, quality control. Box 22, THE CHEMIST.

Consultant-representative: F. A. I. C. Available for exploration-contact-liaison work in Southern California on daily fee or job basis. Highest references. 25 years laboratory, manufacturing executive, and sales experience. Box 24, THE CHEMIST.

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For Your Library

Biochemical Preparations

Vol. 3. Esmond E. Snell, Editor. John Wiley & Sons, Inc. 1953. 6¼"x9¼". 128 *pp.* $3.50.

This series contains a collection of improved versions of known procedures. All methods were subjected to checking by another than the authors' laboratory. Principles of procedures, purity, certain properties, and yields are given. The present volume includes crystalline muscle phosphorylase, ribonuclease, coenzyme I, coenzyme II, pyridoxamine phosphate, pyridoxal phosphate, isocitric acid, dihydroxyfumaric acid, ornithine, citruline, kynurenine, penicillamine and twelve other compounds. There is a well selected bibliography, a subject index, and a supplement listing 64 compounds of biochemical importance that were published in the first 32 volumes of *Organic Synthesis*. This series is a valuable contribution to the biochemical literature.

—Dr. Henry Tauber, F.A.I.C.

Barrett Tar Bases

Barrett Division, Allied Chemical & Dye Corporation, 40 *Rector St., New York 6, N. Y.* 96 *pp.*

This is an unusually attractive book which Barrett promises to send without cost to personnel of business firms — why not also to teachers? It gives tables of the properties of pyridine, quinoline, isoquinoline and homologues, describes methods of preparing and using derivatives, and gives a collection of abstracts from journal and patent literature. Methods of handling and basic testing are included. Since the uses of tar bases, here divided into eleven groups, comprise a great number of fields from pharmaceuticals to metal cleaning compounds, the compilation should be welcome to many chemists. One-hundred references are listed.

There is only one suggestion I have to make for a future edition. In the abstracts, the names of the authors of papers are recorded, while the names of the inventors of the listed patents are omitted in favor of the assignees. Is this not an injustice which should be remedied?

—Dr. Eduard Farber, F.A.I.C.

Physical Chemistry of the Hydrocarbons

Edited by Adalbert Farkas, F.A.I.C. Vol. II. Academic Press, Inc. 1953. 410 *pp. Price* $9.00

This summary of the physio-chemical basis of modern techniques for the identification, analysis, separation and utilization of hydrocarbons has been arranged for the use of chemists, engineers and physicists engaged in hydrocarbon research and technology. From widely scattered sources, material has been collected and presented in convenient, easily readable form. The chapters cover: Density and Refractive Index; Surface Tension and Parachor; Heat Capacity; Critical Behavior; Optical Activity; Mechanisms of Some Reactions; and Separation and Purification by Selective Adsorption.

Author and subject indexes are included and the text clearly illustrated by charts and diagrams.

—Dr. Frederick A. Hessel, F.A.I.C.

Electrochemical Constants

National Bureau of Standards Circular 524. (1953). *Office of Scientific Publications, Washington* 25, *D..C.* 310 *pp.* 6" x 9¼". $2.00.

A collection of papers on the latest results in the field of fundamental electrochemistry, the value of the Faraday, electrolytes, standard EMF and pH scales.

Electrochemical Data

By B. E. Conway. Elsevier Press. 1952. 394 *pp.* 6" *x* 9". $8.75.

A most comprehensive and representative collection of electrochemical data, including properties of solutions, high temperature melts, enzymes, buffers, ionic equilibrium and activity coefficients, with copious references. A unique reference work useful to research and industrial workers.

—Dr. John A. Steffens, F.A.I.C.

An Evaluation of Relativity

After a Half-Century. By C. A. Muses, Ph.D. S. Weiser, Inc. 1953. 48 *pp.* $2.15.

An analysis of the so-called special and general theories of relativity with respect to their usefulness to science, including an explanation of the spinor solution of the unified field equations.

Chemical Books Abroad

Rudolph Seiden, F.A.I.C.

Verlag des Druckhauses Tempelhof (Ullstein), Berlin: *Die Welt der Retorte,* by H. J. Flechtner; 92nd thousand, 448 pp., DM.12.80.—The author teaches laymen how everything in this great world of ours is built from the simple elements; 180 excellent drawings (many of them witty) and 16 tables supplement the text. • *Elixiere des Lebens,* by H. Graupner; 140th thousand, 215 pp., DM.7.80.—Hormones and vitamins and their importance for health, sex life, and ability to work are discussed in an interesting and easily understandable manner. • *Kaempfer fuer das Leben,* by Paul de Kruif, 71st thousand, 327 pp., DM. 10.80.—A German translation of the famous book "Men against Death" which tells of the heroism of many scientists who so greatly contributed to the improvement of the health and the prolongation of man's life expectancy.

Oliver & Boyd Ltd., Edinburgh (D. Van Nostrand Comp., New York): *Dictionary* of Scientific Terms, by I. F. and W. D. Henderson and J. H. Kenneth; 5th ed., 506 pp., $12.—Not only definitions of more than 13,500 terms used in anatomy, bacteriology, biology, botany, cytology, embryology, genetics, paleontology, physiology, and zoology are given, but also their derivations and pronunciation. Many of these terms are used in chemical literature, and this is one reason why this dictionary should appeal to chemists; another reason is that numerous chemical compounds and their formulas are listed in it; finally, etymology can be an interesting pasttime—and this book contains plenty of material for such leisurley, yet useful occupation.

George Thieme Verlag, Stuttgart: *Woerterbuch fuer Aerzte, Vol. 2: Englisch-Deutsch,* by F. Lejeune and W. E. Bunjes; 1953, 1737 pp., DM 58.50.—Approximately 75,000 terms, mostly concerning medicine and related sciences, are translated from English into German; volume 1, the German-English dictionary (which is of greater interest to American readers of German professional literature) was discussed in THE CHEMIST in January, 1953. • *Das Analzaepfchen in der Geschichte der Therapie,* by P. Diepgen; 1953, 44 pp., paper covers, DM 4.20.—An illustrated history of the age-old use of suppositories; with 157 references.

Ferdinand Enke Verlag, Stuttgart: *Aktive Kohle,* by G. Bailleul, K. Bratzler, W. Herbert, and W. Vollmer; 3rd ed., 143 pp. (56 ill., 17 tables), DM 19.60.—A symposium on activated charcoal — its production, action, testing, and uses, especially for the purification and separation of gases, recovery of vapors, decolorization, water purification, and as electrode in batteries. • *Organische Faellungsmittel in der quantitativen Analyse,* by W. Prodinger; 3rd ed., 232 pp., DM 34.—The author (who is the son of one of my teachers) revised the text of his well-known book completely; it differs a great deal now from the English translation which appeared in America in 1940. In the new edition, theoretical discussions are condensed into 8 pages; the remainder of the book is donated to a multitude of methods for the quantitative determination of metals, minerals, and technical products with the help of 36 organic reagents. • *Die feste Kohlensaeure,* by J. Kuprianoff; 2nd edition, 125 pp. (33 ill., 19 tables), paper covers DM 18.—The various production methods of dry ice and its many uses at home, in the laboratory, and in industry are described in detail. A listing of hundreds of USA, German, English, French, and Swiss patents concludes this monograph. • *Die Chemie der natuerlichen Alkaloide, Vol.* 1, by Gertrud Woker; 1953, 448 pp., paper covers DM 78.—The first half of this new work concerning the chemistry of the natural alkaloids deals with betaines, cystine, lupinine, sparteine, piperine, chavi-

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cine, ricinine, nicotine, quinine, coniine, coniceines, pelletierines, and alkaloids of the Solanaceae and Veratrum. • *Chemische Textilfasern, Filme and Folien,* by R. Pummerer; 1953. *Part* 8 (160 pp., DM 20.-) and *part* 9 (212 pp., DM 28.-) conclude this well-illustrated study of textile fibers, films, and foils. The previously published parts of this work were discussed in the April, 1952, and October, 1953 issues of THE CHEMIST. The editor, his 34 coworkers, and the publisher are to be congratulated on their outstanding job. This very thorough work, seemingly the first in its field, should be translated into English.

Something New

"Roalox Burundum-Fortified Mill Jars." Information. Stanley B. Craig, U.S. Stoneware Co., Akron 9, Ohio.

"Model C Precision Colorimeter." Information. Instrument Development Laboratories, 163 Highland Ave., Needham, Mass.

"Wall Chart of Industrial Chemicals Derived from Oils and Fats." Archer-Daniels-Midland Co., 2191 West 110th St., Cleveland 2, Ohio.

"Jerguson Liquid Level Gages, Transparent Type." Brochure. Jerguson Gage and Valve Co., 80 Fellsway, Sommerville 45, Mass.

"Cornelius Model 32R1500 Air Compressor." Information. Cornelius Co., Dept. KP, 550 39th Ave., N.E., Minneapolis 21, Minn.

"Darvan Dispersing Agents." Technical Bulletin 13. R.T. Vanderbilt Co., 230 Park Ave., New York 17, N. Y.

"La Pine Rubber Tubing Chart." Arthur S. LaPine & Co., 6001 Knox Ave., Chicago 29, Ill.

"Hewitt-Robins' New Style J Vibrex Vibrating Screen." Booklet No. 122-J. Hewitt-Robins, Inc., Stamford, Conn.

"Cosmetic and Drug Manual" and "Tetrines." Catalogs. Glyco Products Co., Inc., 26 Court St., Brooklyn 2, N. Y.

"Lorco Compounds for Precision Barrel Finishing." Handbook. Lord Chemical Corp. 2068 S. Queen St., York 9, Pa.

"Elphco Electronic Relay, Model No. 3." Bulletin 26. Eltro-Physics Co., 287 Broadway, New York 7, N. Y.

"Series 500 Line of Free-Vane Electronic Controllers." Bulletin B226. The Bristol Co., Waterbury 20, Conn.

"Scratch Test Apparatus for Paints, Lacquers and Varnishes." Bulletin 129. Gardner Laboratory, Inc., Bethesda 14, Md.

"DC Motors, ½ to 300 HP and DC Generators, ¾ to 250 KWs." Bulletin 1450. Louis Allis Co., Milwaukee 7, Wisc.

"Lab Planning In 3-D With Labline Kit." Planning Kits. Labline, Inc., 217 N. Desplaines, Chicago 6, Ill.

"Godfrey L. Cabot, Inc., Research Laboratories." Booklet. Godfrey L. Cabot, Inc., 77 Franklin St., Boston 10, Mass.

"Scott Industrial Wipers." Literature. Scott Paper Company, Chester, Pa.

"Hunterlab." Circular. Hunter Associates Laboratory, 5421 Brier Ridge Rd., Falls Church, Va.

"Eclipse 'DO' Solenoid Valves." Catalog. Eclipse Fuel Engineering Co., 1001 Buchanan St., Rockford, Ill.

"Safe Use and Handling of Hydrogen Peroxide." Data Sheet 53. Manufacturing Chemists' Association, Inc., 246 Woodward Bldg., 15th & H Sts., N.W., Washington 5, D.C.

"Portable Electric or Gasoline Powered Winch." Information. St. Anthony Machine Products Co., 2424 East Franklin Ave., Minneapolis 6, Minn.

"Actamer." Technical Bulletin OBD-53-12. Monsanto Chemical Co., St. Louis 4, Mo.

"Packaged Detergent Plant." Information. Foster D. Snell, Inc., 29 West 15th St., New York 11, N. Y.

"New Monochromatic Colorimeter." Catalog D-245. Bausch & Lomb Optical Co., 635 St. Paul St., Rochester, N. Y.

"Fully Automatic Mono-Column Demineralizers." Catalog. Mr. Edward H. Clohessy, Penfield Mfg. Co., Inc., 19 High School Ave., Meriden, Conn.

"What's New for the Laboratory." Booklet. Scientific Glass Apparatus Co., Inc., 100 Lakewood Terrace, Bloomfield, N. J.

"Handbook for Chemistry Assistants." Handbook. Fisher Scientific Co 717 Forbes St., Pittsburgh 19, Pa.

"Santophen L Solution", germicide. Information. Monsanto Chemical Co., St. Louis 4, Mo.

"Ethylbenzene. Technical Data Report." Monsanto Chemical Co., Texas City, Texas.

"Syncroverter Switch." Information. The Bristol Co., Waterbury 20, Conn.

"Lustrex X-700." Water-soluble modified styrene resins. Bulletin. Monsanto Chemical Co., Springfield, Mass.

"Lubond." A new air dry lubricant. Information. Electrofilm Corp., 7116 Laurel Canyon Blvd., North Hollywood, Calif.

"Actamer", new deodorant and antiseptic. Information. Monsanto Chemical Co., St. Louis, Mo.

"Tetracarboxybutane (TCB)." Brochure. Jasonols Chemical Corp., 1085 Myrtle Ave., Brooklyn 6, N. Y.

Wanted: In Brownsville, Texas, an analytical chemist and laboratory, according to the Board of City Development. "New multi-million-dollar industries and the recent growth of food-packing and related industries have created a need for such a laboratory, and businessmen as well as the Board of City Development have offered full cooperation in the establishment of an analytical chemist in the city."

Dedicated: The new administration Buiding of J. T. Baker Chemical Company, Phillipsburg, N. J., "in honor of those employees who entered the Military Service from the J. T. Baker Chemical Company during World War I and World War II."

Condensates

Ed. F. Degering, F.A.I.C.

Petroleum companies produced and delivered a record of 136,532,246 gallons of gasoline per day during 1952.

A new meter measures cyclic or rotational speeds by the magnetic effect between a bit of metal attached to the moving part and a permanent magnet in the pick-up unit rather than by direct contact.

Silvichemistry is the name selected by Rayonier, Inc., for its up-and-coming technology of chipping chemicals out of timber.

Common barbiturates have their power to kill diminished by traces of pentylenetetrazol, yet retain their beneficial properties. Strong Cobb of Cleveland is building antidotes into three of their products.

B-Mercaptoethylamine is reported to give protection against x-rays in therapy of radiation sickness.

Sequestering agents, according to studies by Foster D. Snell, Inc., offer the best means for decontaminating radioactive surfaces after a bomb explosion.

We in science and engineering have been so busy creating new things and new ways of making things that we have almost neglected the investigation and development of the creative process. We have learned some ways to organize groups to create new devices and materials; but much of the process of creation is still left to chance.

—MAURICE NELLES

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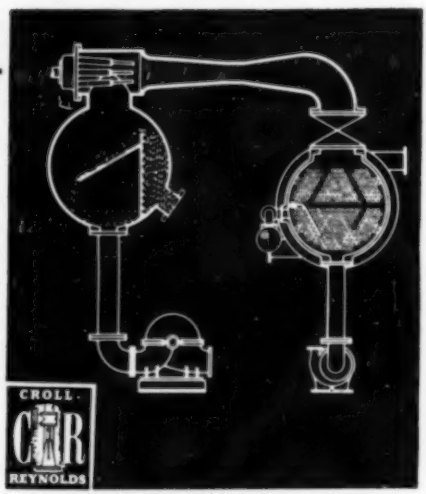

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